UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,362	12/28/2001	Mark Hennecken	2001-024-TAP	8722

7590 07/29/2004

STORAGE TECHNOLOGY CORPORATION
One StorageTek Drive
Louisville, CO 80028-4309

EXAMINER
RODRIGUEZ, GLENDA P

ART UNIT	PAPER NUMBER
2651	

DATE MAILED: 07/29/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/034,362	Applicant(s) HENNECKEN ET AL.	
	Examiner Glenda P. Rodriguez	Art Unit 2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 6-8, 11 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Contreras et al. (US Patent No. 5, 995, 306).

Regarding Claim 1, Contreras et al. teach a method of establishing a data transfer rate, comprising:

> Reading a timing signal from a plurality of reference regions on a moving storage medium, wherein the moving storage medium moves at a speed in a first direction and the reference regions extend in a second direction (Col. 9, L. 9-24, Fig. 9 and Col. 11, L. 1-10 and Fig. 43 and Col. 56, L. 66 to Col. 7, L. 24. Contreras et al. teach a magnetic media wherein a servo signal (i.e. reference regions, because the servo fields give a reference position of the head with respect the medium) is recorded therein which is processed through a servo clocking recovery circuit for timing purposes. See Fig. 43 wherein it teach a tape, wherein it moves in a longitudinal direction while the servo regions move at a first direction and the speed moves at a second direction. See Fig. 1, wherein it teaches the magnetic media 32, moving along the supply/take up reels 34 and 36.)

Writing of data to the moving storage medium at a rate proportional to the speed of the moving medium (Col. 39, L. 33-38 and Col. 41, L. 42 to Col. 42, L. 6).

Regarding Claim 2, Contreras et al. teach all the limitations of Claim 1. Contreras et al. further teach wherein the second direction is perpendicular to the first direction (Fig. 43 and Col. 56, L. 66 to Col. 7, L. 24. Contreras et al. teach magnetic medium moving in a longitudinal direction and the servo channel and clock channels are moving in an upwards and downwards direction, therefore being perpendicular. See also Fig. 1, Element 30, which discloses the movement of the magnetic medium.).

Regarding Claim 6, Contreras et al. teach all the limitations of Claim 1. Contreras et al. further teach reading data from the moving storage medium at a rate proportional to the speed of the moving storage medium (Col. 9, L. 5-24).

Regarding Claim 7, Contreras et al. teach all the limitations of Claim 1. Contreras et al. further teach that the medium is a tape (Fig. 1, Element 32).

Regarding Claim 8, Contreras et al. and Beavers et al. teach all the limitations of Claim 7. Contreras et al. further teach that the medium is a magnetic tape (Fig. 1 and Abstract).

Regarding Claim 11, Contreras et al. teach all the limitations of Claim 1. Contreras et al. further teach wherein the reference regions reside on at least one track from a plurality of tracks located on the moving storage medium (See Fig. 43).

Regarding Claim 17, Contreras et al. teach all the limitations of Claim 13. Contreras et al. further teach a memory buffer and a write head that write data from the memory buffer to the moving storage medium at a rate proportional to the data transfer rate (Col. 41, L. 42-57).

Claim 13, 14, 19-22 are rejected under 35 U.S.C. 102(b) as being unpatentable over Fasen et al. (US Patent No. 6, 122, 124).

Regarding Claim 13, Fasen et al. teach an apparatus, comprising:

A voltage-controlled oscillator having a control input and an output (Pat. No. 6, 122, 124; Col. 3, L. 9-19);

Phase detector having a first input, a second input, and an output (Pat. No. 6, 122, 124; Col. 3, L. 9-19); (Pat. No. 6, 122, 124; Fig. 3, Element 39)

And a first read head (Pat. No. 6, 122, 124; Fig. 3, Line 172),

Wherein the first read head reads reference regions from a moving storage medium, which is moving relative to the first read head, to generate a timing signal, the timing signal is coupled to the first input of the phase detector, the output of the phase detector is fed into the control input of the voltage-controlled oscillator, and the output of the voltage-controlled oscillator is coupled to the second input of the phase detector, whereby the voltage-controlled oscillator produces a signal representing a data transfer rate (Pat. No. 6, 122, 124; Col. 2, L. 45 to Col. 3, L. 27. Fasen et al. teach an ATS system that is used to adapt the speed of the tape according to the host data rate (i.e. transfer rate). It teaches the usage of a PLL (in which a VCO is used to produce an AC output having a frequency proportional to the input control voltage, thusly representing the rate of input data) in order to ensure that the data bits are written to the tape uniformly at any tape speed.).

Regarding Claim 14, Fasen et al. teach all the limitations of Claim 13. Fasen et al. further teach a filter, wherein the output of the phase detector is coupled to the control input of the voltage-controlled oscillator through the filter (Pat. No. 6, 122, 124; Col. 3, L. 9-27).

Regarding Claim 19, Fasen et al. teach all the limitations of Claim 13. Contreras et al. further teach wherein the reference regions reside on at least one track from a plurality of tracks located on the moving storage medium (See Fig. 43).

Regarding Claim 20, Fasen et al. teach all the limitations of Claim 13. Fasen et al. further teach wherein the reference regions extend in an extension direction that is different from a direction of motion of the moving storage medium (Pat. No. 6, 122, 124; Fig. 2, Elements 40 (servo elements in which timing measurements are found) and 37 (tape moving direction) are in different directions according to their placement (medium moves from left to right) and servo fields extend from north to south).).

Regarding Claim 21, Fasen et al. teach all the limitations of Claim 20. Fasen et al. further teach wherein the extension direction is perpendicular to the direction of motion of the moving storage medium (Pat. No. 6, 122, 124; Fig. 2, Elements 40 (servo elements in which timing measurements are found) and 37 (tape moving direction) are perpendicular according to their placement (medium moves from left to right) and servo fields extend from north to south).).

Regarding Claim 22, Fasen et al. teach all the limitations of Claim 13. Fasen et al. further teach wherein the reference regions are interleaved with a timing-based servo pattern located on the moving storage medium (Pat. No. 6, 122, 124; Abstract, Fig. 8, Col. 6, L. 1-11, L. 21-29, L. 31-35. Fasen et al. teaches that the timing measurements are extracted from the servo

regions, therefore, it is obvious that the servo regions (reference regions) are intertwined with the timing pattern.).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 9, 10, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Contreras et al. (US Patent No. 5, 995, 306) in view of Fasen et al. (US Patent No. 6, 122, 124).

Regarding Claim 9, Contreras et al. teach all the limitations of Claim 1. Contreras et al. fail to teach wherein the medium is a disk. However, this feature is well known in the art as disclosed by Fasen et al. wherein it teachs a magnetic medium being a disk (Pat. No. 6, 122, 124; Col. 5, L. 32-33. Fasen et al. teach that the invention is applied to a tape or other form of magnetic media, which can be a magnetic disk, for example). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Contreras et al.'s invention in order to produce a tracking clock for a disk and prevent determine the disk's speed (Pat. No. 6, 122, 124; See Abstract).

Regarding Claim 10, Contreras et al. and Fasen et al. teach all the limitations of Claim 9. Fasen et al. further teach that the disk is one of a magnetic disk and an optical disk (Pat. No. 6, 122, 124; Col. 5, L. 32-33. Fasen et al. teach that the invention is applied to a tape or other form of magnetic media, which can be a magnetic disk, for example).

Regarding Claims 12, Contreras et al. teach all the limitations of Claims 11. Contreras et al. fails to teach wherein the reference regions are interleaved with a timing-based servo pattern located on the moving storage medium. However, this feature is well known in the art as disclosed by Fasen et al., wherein it teaches the reference regions being interleaved with a timing-based servo pattern located on the moving storage medium (Pat. No. 6, 122, 124; Abstract, Fig. 8, Col. 6, L. 1-11, L. 21-29, L. 31-35. Fasen et al. teaches that the timing measurements are extracted from the servo regions, therefore, it is obvious that the servo regions (reference regions) are intertwined with the timing pattern.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Contreras et al.'s invention in order to interleave the timing signal with the servo pattern in order to determine the speed, with respect to the head's location (Pat. No. 6, 122, 124; See Abstract).

Claims 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fasen et al. (US Patent No. 6, 122, 124) in view of Contreras et al. (US Patent No. 5, 955, 306).

Regarding Claim 23, Fasen et al. teach a storage medium product comprising:

> A recording surface having at least one servo track (Pat. No. 6, 122, 124; Fig. 2. Fasen et al. teach a tape medium that has a recordable surface.),
>
> Wherein the servo track includes a plurality of servo bands interleaved with a plurality of reference regions (Pat. No. 6, 122, 124; Abstract, Fig. 2, Col. 6, L. 1-11, L. 21-29, L. 31-35. Fasen et al. teach a servo area (Element 40)).

Although Fasen et al. teach that the servo medium has a servo timing demodulation scheme, it fails to address a reference region. However, this feature is well known in the art as disclosed by Contreras et al., wherein it teaches a medium wherein their clock recovery signal retrieves a

timing signal from the servo area (Pat. No. 5, 995, 306; Col. 9, L. 9-24. Contreras et al. teach of extracting a TS (Track Sense) signal in order to extract a timing signal.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fasen et al.'s invention in order to rerecord information at an exact defective sector without affecting the adjacent sectors (Pat. No. 5, 995, 306; See Abstract).

Regarding Claim 24, the combination of Fasen et al. and Contreras et al. teach all the limitations of Claim 23. The combination further teaches wherein the recording surface has a direction of motion (Pat. No. 6, 122, 124; Fig. 2, Element 37 (shows direction of motion)).

Regarding Claim 25, the combination of Fasen et al. and Contreras et al. teach all the limitations of Claim 24. The combination further teaches wherein the direction of motion is circular (Pat. No. 6, 122, 124; Col. 5, L. 32-33. Fasen et al. teach that the invention is applied to a tape or other form of magnetic media, which can be a magnetic disk, for example. It is known in the art that the disk's direction of motion is circular).

Regarding Claim 26, the combination of Fasen et al. and Contreras et al. teach all the limitations of Claim 24. The combination further teaches wherein the direction of motion is linear (Pat. No. 6, 122, 124; Fig. 2, Element 37).

Regarding Claim 27, the combination of Fasen et al. and Contreras et al. teach all the limitations of Claim 23. The combination further teaches wherein the reference regions extend in an extension direction that is different from a direction of motion of the moving storage medium (Pat. No. 6, 122, 124; Fig. 2, Elements 40 (servo elements in which timing measurements are found) and 37 (tape moving direction) are in different directions according to their placement (medium moves from left to right) and servo fields extend from north to south).).

Regarding Claim 28, the combination of Fasen et al. and Contreras et al. teach all the limitations of Claim 27. The combination further teaches wherein the extension direction is perpendicular to the direction of motion of the moving storage medium (Pat. No. 6, 122, 124; Fig. 2, Elements 40 (servo elements in which timing measurements are found) and 37 (tape moving direction) are perpendicular according to their placement (medium moves from left to right) and servo fields extend from north to south).).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fasen et al. (US Patent No. 6, 122, 124) in view of Contreras et al. (US Patent No. 5, 995, 306). Fasen et al. teach all the limitations of Claim 13. Fasen et al. further teach the use of two read heads, one to read data and the other to read servo regions (reference regions) (Pat. No. 6, 122, 124; Fig. 3, Elements 39 and 172). Fasen fails to teach the use of a memory buffer and to read data from the memory buffer to the moving storage medium at a rate proportional to the data transfer rate. However, this feature is well known in the art as disclosed by Contreras et al., wherein it teaches the use of a memory buffer and to read data from the memory buffer to the moving storage medium at a rate proportional to the data transfer rate (Pat. No. 5, 995, 306; Col. 39, L. 33-38 and Col. 41, L. 42 to Col. 42, L. 6). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fasen et al.'s invention in order to control the tape speed (Pat. No. 5, 995, 306; Col. 9, L. 66 to Col. 10, L. 3).

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Contreras et al. (US Patent No. 5, 955, 306) in view of Abe (Derwent Acc No. 1992-167403).

Regarding Claim 3, Contreras et al. teach all the limitations of Claim 1. Contreras et al. fail to teach wherein locking a variable frequency oscillator to the timing signal to generate a

data transfer rate. However, this feature is well known in the art as disclosed by Abe, wherein it teaches locking a variable frequency oscillator to the timing signal to generate a data transfer rate (Derwent Acc-No. 1992-167403; See USE/ADVANTAGE). It would have bee obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Contreras et al.'s invention in order to accommodate large changes in data transfer rate (Derwent Acc-No. 1992-167403; See USE/ADVANTAGE).

Regarding Claim 4, the combination of Contreras et al. and Abe teach all the limitations of Claim 3. The combination further teach wherein locking the variable-frequency oscillator includes bringing a phase-locked loop into lock (Derwent Acc-No. 1992-167403; See USE/ADVANTAGE).

Regarding Claim 5, the combination of Contreras et al. and Abe teach all the limitations of Claim 3. The combination further teach wherein the variable-frequency oscillator is a voltage-controlled oscillator (Derwent Acc-No. 1992-167403; See USE/ADVANTAGE).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fasen et al. (US Patent No. 6, 122, 124) in view of Landman et al. (US Patent No. 6, 028, 488). Fasen et al. teach all the limitations of Claim 14. Fasen et al. fail to teach wherein the filter is a digital filter. However, this feature is well known in the art as disclosed by Landman et al., wherein it teaches the use of a digital filter in a phase detector (Pat. No. 6, 028, 488; Col. 1, L. 62-67). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fasen et al.'s invention in order to have a much better noise immunity (Pat. No. 6, 028, 488; Col. 2, L. 1-5).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fasen et al. (US Patent No. 6, 122, 124) in view of Zortea et al. (US Patent No. 6, 389, 090). Fasen et al. teach all the limitations of Claim 14. Fasen et al. fail to teach wherein the filter is an analog filter. However, this feature is well known in the art as disclosed by Zortea et al., wherein it teaches the use of a analog filter in a phase detector (Pat. No. 6, 389, 090; Col. 2, L. 15-25). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fasen et al.'s invention in order to generate pulses which are proportional to the phase errors (Pat. No. 6, 389, 090; Col. 2, L. 15-25).

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fasen et al. (US Patent No. 6, 122, 124) in view of Gillingham et al. (US Patent No. 6, 075, 666). Fasen et al. teach all the limitations of Claim 23. Fasen et al. fail to teach wherein the reference regions are recorded at a first frequency and the servo bands are recorded at a second frequency that is distinct from the first frequency. However, this feature is well known in the art as disclosed by Gillingham et al., wherein it teaches regions that are recorded at a first frequency and the servo bands are recorded at a second frequency that is distinct from the first frequency (Pat. No. 6, 075, 666; Col. 2, L. 57 to Col. 3, L. 22. Gillingham et al. teach the use of plural frequencies in order to monitor the tape head position.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Fasen et al.' s invention in order to control the head relative to the position to the tape.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Beavers et al. (US Patent No. 6, 307, 701).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (703) 305-8411. The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (703) 308-4825. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gpr
July 12, 2004.

SINH TRAN
PRIMARY EXAMINER